2002 NEW YORK CITY HOUSING AND VACANCY SURVEY
SAMPLE DESIGN, ESTIMATION PROCEDURE AND ACCURACY STATEMENT

I. SAMPLE DESIGN

The purpose of the New York City Housing and Vacancy Survey (NYCHVS) is to measure the rental and homeowner vacancy rates, as well as various household and person characteristics. The City of New York is required by law to periodically conduct a survey to determine if rent regulations should be continued. New York City's prime consideration is the "vacant available for rent" rate, which is defined as the ratio of the vacant available for rent units to the total number of renter occupied and vacant available for rent units for the entire city. The design required the standard error of the estimate of this vacant available for rent rate for the entire city be no more than one-fourth of 1 percent, if the actual rate was 3 percent.

A. Sampling Frames

The survey includes only housing units. The principal exclusions were living quarters classified as:

- transient hotels,
- commercial and mission lodging houses,
- inmate living quarters in institutions,
- quarters for the military on military installations, and
- other large group quarters not meeting the definition of a housing unit.

Also, generally excluded were housing units in special places. These included housing units located on the grounds of institutions (both civilian and military), with the exception of residential hotels and motels.

We selected the 2002 NYCHVS sample from housing units in the following three sample frames:

- Housing units included in the 2000 Census.

- Housing units constructed since the 2000 Census and those that were nonresidential at the time of the 2000 Census but have since been converted to residential units.

- Housing units in structures owned by New York City (in rem). These types of housing units were oversampled to ensure a large enough sample for analysis of this subuniverse. Note that these housing units are also part of the 2000 census frame.

B. Sample Selection

Within each frame, we selected clusters (groups of housing units) of generally four housing units, with the exception of in rem units where we selected clusters of approximate size five. For all frames except the in rem frame, the housing units were consecutive units. For the in rem frame, we selected a systematic sample of housing units within each sample building.

1. Housing Units Included in the 2000 Census

   Within this frame, we sorted housing units by (a) borough, (b) sub-borough, (c) percent renter occupied in the block, (d) tract, (e) block number, (f) basic street address, and (g) unit designation. We selected a systematic sample of housing units across all boroughs. This frame included in rem units.

2. Housing Units Constructed Since the 2000 Census

   We selected units in this frame from Certificates of Occupancy (C of Os) issued between January 2000 and November 2001. We dropped all housing units that were also on the 2000 census frame from this sample. We sorted the housing units by borough and date (i.e., year and month) of issue and selected a systematic sample of housing units within each borough. We listed each structure that contained a sample housing unit and then identified the designated sample unit in the order in which the unit appeared on these listings.

3. Housing Units in Structures Owned by New York City (in rem)

   This frame consisted of units in structures owned by New York City as of December 2001. The City owned these units because the owner failed to pay the real estate tax and/or other charges on the property. We selected a probability proportional to size sample of in rem buildings first, then selected sample units within buildings. First, we sorted the buildings by:

   (1) borough, and

   (2) size of the building (number of units)

   We selected a systematic sample of buildings, then, after listing the individual units in each building, we selected a systematic sample of units within each sample building.

C. Sample Size

The total number of sample housing units selected for the 2002 NYCHVS was 18,293. The table below provides the total number of sampled housing units by borough.

Borough	Number of Housing Units
Bronx	2,810
Brooklyn	5,235
Manhattan	4,846
Queens	4,493
Staten Island	909
Total	18,293

Of these housing units, 325 interviews were not obtained because, for occupied housing units,

- the occupants refused to be interviewed,
- were not at home after repeated visits,
- or were unavailable for some other reason.

For vacant units, an interview wasn't obtained if no informed respondent could be found after repeated visits. These 325 noninterviews are known as type-A noninterviews. There were an additional 811 units, known as type-C noninterviews, that were not interviewed because they no longer exist or are uninhabitable. This classification produced a 98 percent overall response rate.

The sample housing units were visited between January and June 2002 by field representatives (FRs) hired and trained for this task. The FRs visited each sample address and completed a questionnaire for both occupied and vacant units. In addition, for evaluation purposes, the occupancy status of all vacant units and a sample of occupied units was independently determined in a reinterview. An independent third interview reconciled any differences.

II. ESTIMATION PROCEDURE

To compute estimates of housing unit characteristics based on the data collected for the 2002 NYCHVS, we performed the following adjustments to the weights of sample housing units:

1. Because in rem sample units and a few census sample units were eligible for selection from both the 2000 Census and the in rem frames, we adjusted the basic weights (the inverse of the probability of selection for the unit) of these units to reflect the fact that they had multiple chances of selection.

2. We adjusted the basic weight of each interviewed housing unit to account for type-A noninterviews.

3. We used a three-stage housing unit ratio estimation procedure to do the following:

   - to account for known sampling variability in the 2000 census frame (frame one),
   - to account for known sampling variability in the in rem frame (frame three),
   - to bring the sample estimates of housing units into close agreement with estimates derived from independent sources, and
   - to account for housing unit undercoverage.

We used the same procedure to estimate person characteristics, but added a ratio estimate factor to adjust for person undercoverage within households.

A. Type-A Noninterview Adjustment Factor

We applied a noninterview adjustment factor to all interviewed units to account for type-A noninterviews. We applied the factor separately for old construction units (frames one and three) and new construction/conversion units (frame two) as follows:

Old Construction

For sample housing units selected from the 2000 census, we computed the factor separately by borough using the following 2000 census characteristics:

- For renter-occupied HUs , we used

  (a) Subborough (Bronx(10), Brooklyn (16), Manhattan (10), Queens (14), Staten Island (3))

  (b) Number of Persons in the Housing Units (1, 2, 3-4, 5 or more)

  (c) Race of the Householder (White, Black, All Remaining Races)

- For owner-occupied HUs, we used

  (a) Subborough (Bronx(10), Brooklyn (16), Manhattan (10), Queens (14), Staten Island (3))

  (b) Number of Persons in the Housing Units (1, 2, 3-4, 5 or more)

- For vacant HUs, we used vacancy status (vacant for rent; vacant for sale; rented/sold; seasonal; migrant; other.)

- We computed the factor for in rem units by borough.

New Construction

For new construction/conversion units, we computed the factor separately by type of unit (new construction and conversion), year the C of O was issued (new construction only), and borough.

The noninterview adjustment factor was equal to the following ratio for each cell:

$$\frac{\text{(weighted count of interviewed units) + (weighted count of Type A noninterviews)}}{\text{(weighted count of interviewed units)}}$$

B. Ratio Estimate Factors

For each ratio estimation procedure, we computed factors for ratio estimate cells (characteristics) and applied the factors to the appropriate units in the corresponding cell. The factors were equal to the following ratio:

$$\frac{\text{Independent estimate of number of HUs (persons) for the cell}}{\text{NYCHVS sample estimate of number of HUs (persons) for the cell}}$$

The denominators of the ratios equaled the sum of the weights of housing units (or persons) with all previous factors applied.

1. 2000 Census Ratio Estimate Factor

   This procedure adjusted for differences between the 2000 census counts and the corresponding sample counts. We applied this ratio estimation procedure to all 2000 census units in the NYCHVS sample (units from frame one and frame three). We computed the factors separately by borough using the following 2000 census characteristics:

   For renter-occupied housing units, we used

   (a) Subborough (Bronx(10), Brooklyn (16), Manhattan (10), Queens (14), Staten Island (3))

   (b) Number of Persons in the Housing Units (1, 2, 3-4, 5 or more)

   (c) Race of the Householder (White, Black, All Remaining Races)

   For owner-occupied housing units, we used

   (a) Subborough (Bronx(10), Brooklyn (16), Manhattan (10), Queens (14), Staten Island (3))

   (b) Number of Persons in the Housing Units (1, 2, 3-4, 5 or more)

   For vacant housing units, we used vacancy status (vacant for rent; vacant for sale; rented/sold; seasonal; migrant; other.)

2. In Rem Ratio Estimate Factor

   This procedure adjusted for known sampling variability in the in rem sample selection. We applied this ratio estimation procedure to all in rem sample units (frame three). We computed ratio estimate factors for each borough (5 cells). The independent estimates were the total number of in rem units in each borough in the in rem frame.

3. 2002 Housing Unit Ratio Estimate Factor

   This procedure adjusted the 2002 NYCHVS sample estimate for housing unit undercoverage by controlling the sample estimate to independent estimates of 2002 total housing units derived from 2000 census housing

unit totals. We applied this ratio estimation procedure to all interviewed housing units. We calculated the ratio estimate factor for each of the boroughs (5 cells). The independent estimates were equal to the total number of housing units in each of the boroughs at the time of the survey.

4. 2002 Person Ratio Estimate Factor

This additional adjustment accounted for sampling variability and known coverage deficiencies for persons within interviewed households. This ratio estimation assumes that reference persons, spouses or unmarried partners are always picked up during the interview and only persons other than a reference person, spouse or unmarried partner could be missed in households. We computed this factor within each borough by age, race and sex (80 cells).

- The numerator of the ratio equaled the independent estimate of 2002 total persons for the cell minus the NYCHVS sample estimate of reference persons and spouses or unmarried partners. The independent estimate were derived from 2000 census person totals.

- The denominator of the ratio equaled the NYCHVS sample estimate of persons other than reference persons, spouses or unmarried partners for the cell. The person ratio estimate factor was applied only to the persons other than reference persons, spouses, or unmarried partners.

The ratio estimation procedures, as well as the overall estimation procedure, reduced the sampling error for most statistics below what would have been obtained by simply weighting the sample by the basic weight.

III. SAMPLING AND NONSAMPLING ERRORS

Since the statistics produced from this survey are estimates derived from a sample, they will differ from the "true values" being estimated. There are two types of errors which cause estimates based on a sample survey to differ from the true value - sampling error and nonsampling error.

A. Nonsampling Errors

If every housing unit in New York City were interviewed, the estimates of housing unit characteristics would still differ from the true value (for example, the median contract rent). In this instance, the difference is due solely to nonsampling errors. We attribute nonsampling errors in sample surveys to many sources:

- deficiencies in the sampling frame (i.e., not all housing units are covered),
- inability to pick up all persons within sample households,
- inability to obtain information about all cases in the sample,
- definitional difficulties,
- differences in the interpretation of questions,
- inability or unwillingness to provide correct information on the part of the respondents, and
- mistakes in recording, coding or keying the data obtained.

There are also other errors of collection, response, processing, coverage, and estimation for missing data.

In the 2002 NYCHVS, we missed about four percent of the housing units in the five boroughs covered by the survey. Overall, we missed about 4 percent of the people in sample households. This within-household undercoverage varied by age, race, sex, and borough. It ranged from about a 26-percent overcoverage of Other males between 15-24 in Staten Island to a 96-percent undercoverage of African American males between 15-24 in Staten Island. The following table gives the undercoverage of the various race-sex groups for the city as a whole:

Race-Sex Group	Undercoverage
White & Other Females	6%
White & Other Males	10%
African American Females	7%
African American Males	10%

We adjusted for this undercoverage through the housing unit and person ratio estimate factors. Measures of other errors for this survey are not available. However, we believe some of the important response and most of the operational errors were detected and corrected during the Bureau's review of the data for reasonableness and consistency.

B. Sampling Errors

Sampling error is a measure of how estimates from a sample vary from the actual value. NOTE: By the term "actual value" we mean the value we would have gotten had all housing units been interviewed, under the same conditions, rather than only a sample.

The formulas in Tables 1 through 6 allow you to compute a range of error such that there is a known probability of being correct if you say the actual value is within the range. The error formulas are approximations to the errors. They indicate the order of magnitude of the errors rather than the actual errors for any specific characteristic. To construct the range, add and subtract the error computed from the formulas to the estimate.

The letter "A" in the formula represents the weighted sample estimate you derive from the file.

The letter "Z" determines the probability the actual value is within the range you compute. The larger the value of Z, the larger the range, and the higher the odds the actual value will be in the range. The following values of Z are most commonly used.

Value of Z	Meaning
1.00	There is a 67-percent chance you'll be correct if you say the actual value is in the range you compute.
1.64	There is a 90-percent chance you'll be correct if you say the actual value is in the range you compute.
1.96	There is a 95-percent chance you'll be correct if you say the actual value is in the range you compute.
2.58	There is a 99-percent chance you'll be correct if you say the actual value is in the range you compute.

Note that if Z = 1.00, the formula computes the standard error. Ranges of 90 and 95-percent are commonly used. The range of error is also referred to as the confidence interval since there is a certain level of confidence the actual value is within the interval.

For example there are 17,612 vacant-for-rent units in Brooklyn. To compute a 90-percent confidence interval, you would use the first formula in Table 3 and you would compute the error as follows:

$$Z \times \sqrt{(262.81 \times A) - (.000263 \times A^2)}$$

$$1.64 \times \sqrt{(262.81 \times 17{,}612) - (.000263 \times 17{,}612^2)} = 3{,}497$$

Thus there is a 90-percent chance you'll be correct if you conclude the actual number of vacant-for-rent units in Brooklyn is 17,612 plus or minus 3,497, or in the range 14,115 to 21,109.

If the estimate involves two characteristics from Tables 1 through 6, use the formula with the larger first number under the square root.

1. Percents

The formula for computing the error of any percent derived from the data is the following:

$$Z \times Y \times \sqrt{\frac{262.81 \times P \times (100-P)}{B}}$$

where:

Z: defines the confidence the range will include the actual value,

Y: is the number from the last column of Tables 1 through 6 (chosen based on the denominator),

P: is the percent you calculate, and

B: is the denominator of the percent.

For example, there are 826,876 households in units built between 1947 and 1969 and 330,188, or 39.9 percent, are owners. To compute a 90-percent confidence interval you would plug the following numbers into the above formula:

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$$1.64 \times 1.572 \times \sqrt{\frac{262.81 \times 39.9 \times 60.1}{826{,}876}} = 2.3$$

Thus, if you say that the actual percentage of owners in buildings built between 1947 and 1969 is between 37.6 percent and 42.2 percent, there is a 90-percent chance you'll be correct.

2. Differences

People often ask whether two numbers are actually different. If the range of error for the difference doesn't include zero, the numbers are different. As a general rule, if the confidence intervals don't overlap, they're different. To compute the range of error of the difference use the following formula:

$$\sqrt{(\text{error on first number})^2 + (\text{error on second number})^2}$$

This formula is quite accurate for (a) the difference between estimates of the same item in two different areas or (b) the difference between separate and uncorrelated items in the same area. If there is a high positive correlation between the two items, the formula will overestimate the error. If there is a high negative correlation, the formula will underestimate the error. The following illustration shows how to compute the error of a difference.

There are 8,523 vacant-for-rent units in New York City with 3 to 5 units in the building and 4,159 vacant-for-rent units with 6 to 9 units in the building. The respective errors for a 90-percent confidence interval are 2,451 and 1,714. The error for a 90-percent confidence interval for the 4,364 difference is the following:

$$\sqrt{(2{,}451)^2 + (1{,}714)^2} = 2{,}991$$

Thus, there is a 90-percent chance you'll be correct if you say the actual difference between vacant-for-rent units in 3 to 5 unit buildings vs. 6 to 9 unit buildings in New York City is between 1,373 and 7,355.

3. Medians

The median is the value 50-percent of the way through the distribution. Thus, 50-percent of the total falls below and 50-percent falls above the median. Note that the median presented in this example is the true median (i.e., computed by SAS) not an approximation. You can construct a confidence interval around the median by computing the standard error on

a 50-percent characteristic and then translating that into an interval for the characteristic.

a. Using the error formula for percents, above, compute the error of 50-percent. The total number of housing units from the distribution is the denominator in the formula. Subtract the "not applicable" category from the total.

b. Calculate the confidence interval for the true median by adding and subtracting the width of the interval containing the median times the standard error on the 50-percent characteristic divided by the proportion of units in the interval containing the median, to the median.

The probability you will be correct if you conclude that the actual median is within the interval depends on the value of Z in the error of percent formula. The following example shows how to compute a 90-percent confidence interval.

The median value for all occupied housing units in New York City is $250,000. The number of occupied housing units in the distribution of value of units is presented below.

Distribution of Value of Units

Value	Number of HUs
Less Than $25,000	43,901
$25,000-$49,999	18,216
$50,000-$74,999	25,784
$75,000-$99,999	34,884
$100,000-$149,999	56,693
$150,000-$199,999	89,119
$200,000-$249,999	155,401
$250,000-$299,999	136,545
$300,000-$349,999	114,120
$350,000-$399,999	77,963
$400,000-$499,999	96,441
$500,000-$599,999	49,082
$600,000-$699,999	16,289

Value	Number of HUs
$700,000-$799,999	16,861
$800,000-$999,999	14,280
$1,000,000 or more	36,235
Not Applicable	2,023,504
TOTAL	3,005,318

1. The error on a 50-percent characteristic based on 981,814 (3,005,318 minus the "not applicable" number) housing units is calculated as follows:

$$1.64 \times 1.0000 \times \sqrt{\frac{262.81 \times 50 \times 50}{981,814}} = 1.34$$

2. The 90-percent confidence interval for the median ($250,000) is:

$$250,000 \pm (299,999.5 - 249,999.5) \times \frac{1.34}{13.91} = 250,000 \pm 4,817$$

where:

- 299,999.5-249,999.5 is the width of the interval that contains the median
- 1.34 is the error for a 90-percent confidence interval for the 50-percent characteristic
- 13.91 is the percent of cases that fall in the interval containing the median

Thus, there is a 90-percent chance that you will be correct if you conclude that the actual median for all occupied housing units in New York City is between $245,183 and $254,817.

4. Means

The mean and the median usually differ. The mean is usually higher because it is influenced more heavily than the median by very large values. Use the following formula to estimate the error of the mean:

$$Z \times Y \times \sqrt{\frac{\left[\sum_{i=1}^{n} p_i x_i^2 - \left(\sum_{i=1}^{n} p_i x_i\right)^2\right]}{c}} \times 262.81$$

where:

Y: is the number from the last column of Tables 1 through 6

Z: defines the confidence the range will include the actual value

p_i: is the proportion of total households or persons from a distribution in the i^{th} interval

x_i: is the midpoint of the i^{th} interval (NOTE: The midpoint of the open-ended interval is 1.5 times the lower limit)

c: is the total number of households or persons in the distribution (NOTE: Subtract the number of "not applicable" from the total to get c)

n: is the total number of intervals in the distribution

For example, the mean (or average) value of all owner-occupied housing units in New York City was $335,827 (compared to a median of $250,000). The distribution from which the mean was computed is given below.

Value	Number of HUs	p_i	x_i
Less Than $25,000	43,901	.0447	$12,500
$25,000-$49,999	18,216	.0186	$37,500
$50,000-$74,999	25,784	.0263	$62,500
$75,000-$99,999	34,884	.0355	$87,500
$100,000-$149,999	56,693	.0577	$125,000
$150,000-$199,999	89,119	.0908	$175,000
$200,000-$249,999	155,401	.1583	$225,000
$250,000-$299,999	136,545	.1391	$275,000
$300,000-$349,999	114,120	.1162	$325,000
$350,000-$399,999	77,963	.0794	$375,000
$400,000-$499,999	96,441	.0982	$450,000
$500,000-$599,999	49,082	.0500	$550,000
$600,000-$699,999	16,289	.0166	$650,000
$700,000-$799,999	16,861	.0172	$750,000
$800,000-$999,999	14,280	.0145	$900,000
$1,000,000 Or More	36,235	.0369	$1,500,000
Not Applicable	2,023,504	-----	
Total	3,005,318	1.000	

Plugging the numbers in the above formula, the error for a 90-percent confidence interval on the mean income is computed as follows:

$$1.64 \times 1.000 \times \sqrt{\frac{192{,}566{,}828{,}627 - (334{,}330)^2}{981{,}814}} \times 262.81 = \$7{,}627$$

Thus, there is a 90-percent chance of being correct if you say the mean value of all owner-occupied housing units in New York City was between $328,200 and $343,454.

Table 1: Errors for New York City

	Publication Estimates	Percentages
	The error is the larger of:	Value of Y for Percent Formula
Errors on Housing Units		
Housing Unit Characteristics Not Listed in Tables 7A or 7B	$Z \times \sqrt{262.81 \times A - .000077 \times A^2}$ *or* $Z \times 263$	1.000
Housing Unit Characteristics[1] Listed in Table 7A	$Z \times \sqrt{494.29 \times A - .000145 \times A^2}$ *or* $Z \times 494$	1.371
Housing Unit Characteristics[2] Listed in Table 7B	$Z \times \sqrt{649.38 \times A - .000190 \times A^2}$ *or* $Z \times 649$	1.572
Errors on Persons		
Characteristics of Persons Not Listed Below	$Z \times \sqrt{302.93 \times A - .000038 \times A^2}$ *or* $Z \times 303$	1.074
	NOTE: For any of the person characteristics listed below that are cross-tabbed by Borough and Sub-borough use the formula for the specific characteristic listed below. Don't use the formulas listed below for cross-tabs of characteristics of persons listed below {e.g., Age by sex (males under 25), Age by Race (African Americans under 25), or sex by race (white females)}. Use the formula above (Characteristics of Persons Not Listed Below).	
Whites and other Races and Ethnicity	$Z \times \sqrt{837.76 \times A - .000150 \times A^2}$ *or* $Z \times 838$	1.785
Males	$Z \times \sqrt{837.76 \times A - .000221 \times A^2}$ *or* $Z \times 838$	1.785
Females	$Z \times \sqrt{837.76 \times A - .000201 \times A^2}$ *or* $Z \times 838$	1.785
Persons under 25 yrs. old	$Z \times \sqrt{611.10 \times A - .000077 \times A^2}$ *or* $Z \times 611$	1.525
African Americans	$Z \times \sqrt{1{,}888.08 \times A - .000798 \times A^2}$ *or* $Z \times 1{,}888$	2.680
Borough and Sub-borough[3]	$Z \times \sqrt{1{,}888.08 \times A - .000237 \times A^2}$ *or* $Z \times 1{,}888$	2.680

[1]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7A. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[2]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7B. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[3] Exclude total population in households, all rent controlled items for renter occupied persons, and all total occupied items for owner occupied

housing units. Use the formula for "Characteristics of Persons Not Listed Below" for these person characteristics.

Table 2: Errors for Bronx

	Publication Estimates	Percentages
	The error is the larger of:	Value of Y for Percent Formula
Errors on Housing Units		
Housing Unit Characteristics Not Listed in Tables 7A or 7B	$Z \times \sqrt{262.81 \times A - .000509 \times A^2}$ *or* $Z \times 263$	1.000
Housing Unit Characteristics[1] Listed in Table 7A	$Z \times \sqrt{494.29 \times A - .000956 \times A^2}$ *or* $Z \times 494$	1.371
Housing Unit Characteristics[2] Listed in Table 7B	$Z \times \sqrt{649.38 \times A - .001257 \times A^2}$ *or* $Z \times 649$	1.572
Errors on Persons		
Characteristics of Persons Not Listed Below	$Z \times \sqrt{302.93 \times A - .000230 \times A^2}$ *or* $Z \times 303$	1.074
	NOTE: For any of the person characteristics listed below that are cross-tabbed by Borough and Sub-borough use the formula for the specific characteristic listed below. Don't use the formulas listed below for cross-tabs of characteristics of persons listed below {e.g., Age by sex (males under 25), Age by Race (African Americans under 25), or sex by race (white females)}. Use the formula above (Characteristics of Persons Not Listed Below).	
Whites and other Races and Ethnicity	$Z \times \sqrt{837.76 \times A - .001115 \times A^2}$ *or* $Z \times 838$	1.785
Males	$Z \times \sqrt{837.76 \times A - .001372 \times A^2}$ *or* $Z \times 838$	1.785
Females	$Z \times \sqrt{837.76 \times A - .001191 \times A^2}$ *or* $Z \times 838$	1.785
Persons under 25 yrs. old	$Z \times \sqrt{611.10 \times A - .000465 \times A^2}$ *or* $Z \times 611$	1.525
African Americans	$Z \times \sqrt{1{,}888.08 \times A - .003355 \times A^2}$ *or* $Z \times 1{,}888$	2.680
Sub-borough and Borough[3]	$Z \times \sqrt{1{,}888.08 \times A - .001437 \times A^2}$ *or* $Z \times 1{,}888$	2.680

[1]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7A. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[2]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7B. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[3] Exclude total population in households, all rent controlled items for renter occupied persons, and all total occupied items for owner occupied housing units. Use the formula for "Characteristics of Persons Not Listed Below" for these person characteristics.

Table 3: Errors for Brooklyn

	Publication Estimates	Percentages
	The error is the larger of:	Value of Y for Percent Formula
Errors on Housing Units		
Housing Unit Characteristics Not Listed in Tables 7A or 7B	$Z \times \sqrt{262.81 \times A - .000263 \times A^2}$ *or* $Z \times 263$	1.000
Housing Unit Characteristics[1] Listed in Table 7A	$Z \times \sqrt{494.29 \times A - .000494 \times A^2}$ *or* $Z \times 494$	1.371
Housing Unit Characteristics[2] Listed in Table 7B	$Z \times \sqrt{649.38 \times A - .000649 \times A^2}$ *or* $Z \times 649$	1.572
Errors on Persons		
Characteristics of Persons Not Listed Below	$Z \times \sqrt{302.93 \times A - .000123 \times A^2}$ *or* $Z \times 303$	1.074
	NOTE: For any of the person characteristics listed below that are cross-tabbed by Borough and Sub-borough use the formula for the specific characteristic listed below. Don't use the formulas listed below for cross-tabs of characteristics of persons listed below {e.g., Age by sex (males under 25), Age by Race (African Americans under 25), or sex by race (white females)}. Use the formula above (Characteristics of Persons Not Listed Below).	
Whites and other Races and Ethnicity	$Z \times \sqrt{837.76 \times A - .000561 \times A^2}$ *or* $Z \times 838$	1.785
Males	$Z \times \sqrt{837.76 \times A - .000725 \times A^2}$ *or* $Z \times 838$	1.785
Females	$Z \times \sqrt{837.76 \times A - .000644 \times A^2}$ *or* $Z \times 838$	1.785
Persons under 25 yrs. old	$Z \times \sqrt{611.10 \times A - .000249 \times A^2}$ *or* $Z \times 611$	1.525
African Americans	$Z \times \sqrt{1{,}888.08 \times A - .001962 \times A^2}$ *or* $Z \times 1{,}888$	2.680
Sub-borough and Borough [3]	$Z \times \sqrt{1{,}888.08 \times A - .000769 \times A^2}$ *or* $Z \times 1{,}888$	2.680

[1]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7A. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[2]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7B. For estimates of the housing unit

characteristics for subgroups not listed, use the first formula listed above.

[3] Exclude total population in households, all rent controlled items for renter occupied persons, and all total occupied items for owner occupied housing units. Use the formula for "Characteristics of Persons Not Listed Below" for these person characteristics.

Table 4: Errors for Manhattan

	Publication Estimates	Percentages
	The error is the larger of:	Value of Y for Percent Formula
Errors on Housing Units		
Housing Unit Characteristics Not Listed in Tables 7A or 7B	$Z \times \sqrt{262.81 \times A - .000313 \times A^2}$ *or* $Z \times 263$	1.0000
Housing Unit Characteristics[1] Listed in Table 7A	$Z \times \sqrt{494.29 \times A - .000588 \times A^2}$ *or* $Z \times 494$	1.371
Housing Unit Characteristics[2] Listed in Table 7B	$Z \times \sqrt{649.38 \times A - .000773 \times A^2}$ *or* $Z \times 649$	1.572
Errors on Persons		
Characteristics of Persons Not Listed Below	$Z \times \sqrt{302.93 \times A - .000200 \times A^2}$ *or* $Z \times 303$	1.074
	NOTE: For any of the person characteristics listed below that are cross-tabbed by Borough and Sub-borough use the formula for the specific characteristic listed below. Don't use the formulas listed below for cross-tabs of characteristics of persons listed below {e.g., Age by sex (males under 25), Age by Race (African Americans under 25), or sex by race (white females)}. Use the formula above (Characteristics of Persons Not Listed Below).	
Whites and other Races and Ethnicity	$Z \times \sqrt{837.76 \times A - .000691 \times A^2}$ *or* $Z \times 838$	1.785
Males	$Z \times \sqrt{837.76 \times A - .001159 \times A^2}$ *or* $Z \times 838$	1.785
Females	$Z \times \sqrt{837.76 \times A - .001055 \times A^2}$ *or* $Z \times 838$	1.785
Persons under 25 yrs. old	$Z \times \sqrt{611.10 \times A - .000403 \times A^2}$ *or* $Z \times 611$	1.525
African Americans	$Z \times \sqrt{1{,}888.08 \times A - .006190 \times A^2}$ *or* $Z \times 1{,}888$	2.680
Sub-borough and Borough [3]	$Z \times \sqrt{1{,}888.08 \times A - .001245 \times A^2}$ *or* $Z \times 1{,}888$	2.680

[1]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7A. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[2]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7B. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[3] Exclude total population in households, all rent controlled items for renter occupied persons, and all total occupied items for owner occupied housing units. Use the formula for "Characteristics of Persons Not Listed Below" for these person characteristics.

Table 5: Errors for Queens

	Publication Estimates The error is the larger of:	Percentages Value of Y for Percent Formula
Errors on Housing Units		
Housing Unit Characteristics Not Listed in Tables 7A or 7B	$Z \times \sqrt{262.81 \times A - .000299 \times A^2}$ *or* $Z \times 263$	1.000
Housing Unit Characteristics[1] Listed in Table 7A	$Z \times \sqrt{494.29 \times A - .000562 \times A^2}$ *or* $Z \times 494$	1.371
Housing Unit Characteristics[2] Listed in Table 7B	$Z \times \sqrt{649.38 \times A - .000738 \times A^2}$ *or* $Z \times 649$	1.572
Errors on Persons		
Characteristics of Persons Not Listed Below	$Z \times \sqrt{302.93 \times A - .000136 \times A^2}$ *or* $Z \times 303$	1.074
	NOTE: For any of the person characteristics listed below that are cross-tabbed by Borough and Sub-borough use the formula for the specific characteristic listed below. Don't use the formulas listed below for cross-tabs of characteristics of persons listed below {e.g., Age by sex (males under 25), Age by Race (African Americans under 25), or sex by race (white females)}. Use the formula above (Characteristics of Persons Not Listed Below).	
Whites and other Races and Ethnicity	$Z \times \sqrt{837.76 \times A - .000484 \times A^2}$ *or* $Z \times 838$	1.785
Males	$Z \times \sqrt{837.76 \times A - .000779 \times A^2}$ *or* $Z \times 838$	1.785
Females	$Z \times \sqrt{837.76 \times A - .000731 \times A^2}$ *or* $Z \times 838$	1.785
Persons under 25 yrs. old	$Z \times \sqrt{611.10 \times A - .000275 \times A^2}$ *or* $Z \times 611$	1.525
African Americans	$Z \times \sqrt{1{,}888.08 \times A - .003857 \times A^2}$ *or* $Z \times 1{,}888$	2.680
Sub-borough and Borough [3]	$Z \times \sqrt{1{,}888.08 \times A - .000850 \times A^2}$ *or* $Z \times 1{,}888$	2.680

[1]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7A. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[2]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7B. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[3] Exclude total population in households, all rent controlled items for renter occupied persons, and all total occupied items for owner occupied housing units. Use the formula for "Characteristics of Persons Not Listed Below" for these person characteristics.

Table 6: Errors for Staten Island

	Publication Estimates The error is the larger of:	Percentages Value of Y for Percent Formula
Errors on Housing Units		
Housing Unit Characteristics Not Listed in Tables 7A or 7B	$Z \times \sqrt{262.81 \times A - .001516 \times A^2}$ *or* $Z \times 263$	1.000
Housing Unit Characteristics[1] Listed in Table 7A	$Z \times \sqrt{494.29 \times A - .002851 \times A^2}$ *or* $Z \times 494$	1.371
Housing Unit Characteristics[2] Listed in Table 7B	$Z \times \sqrt{649.38 \times A - .003746 \times A^2}$ *or* $Z \times 649$	1.572
Errors on Persons		
Characteristics of Persons Not Listed Below	$Z \times \sqrt{302.93 \times A - .000673 \times A^2}$ *or* $Z \times 303$	1.074
	NOTE: For any of the person characteristics listed below that are cross-tabbed by Borough and Sub-borough use the formula for the specific characteristic listed below. Don't use the formulas listed below for cross-tabs of characteristics of persons listed below {e.g., Age by sex (males under 25), Age by Race (African Americans under 25), or sex by race (white females)}. Use the formula above (Characteristics of Persons Not Listed Below).	
Whites and other Races and Ethnicity	$Z \times \sqrt{837.76 \times A - .002082 \times A^2}$ *or* $Z \times 838$	1.785
Males	$Z \times \sqrt{837.76 \times A - .003828 \times A^2}$ *or* $Z \times 838$	1.785
Females	$Z \times \sqrt{837.76 \times A - .003617 \times A^2}$ *or* $Z \times 838$	1.785
Persons under 25 yrs. old	$Z \times \sqrt{611.10 \times A - .001357 \times A^2}$ *or* $Z \times 611$	1.525
African Americans	$Z \times \sqrt{1{,}888.08 \times A - .039334 \times A^2}$ *or* $Z \times 1{,}888$	2.680
Sub-borough and Borough [3]	$Z \times \sqrt{1{,}888.08 \times A - .004192 \times A^2}$ *or* $Z \times 1{,}888$	2.680

[1]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7A. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[2]Use this formula only for estimates of the housing unit characteristics and subgroups listed in Table 7B. For estimates of the housing unit characteristics for subgroups not listed, use the first formula listed above.

[3] Exclude total population in households, all rent controlled items for renter occupied persons, and all total occupied items for owner occupied

housing units. Use the formula for “Characteristics of Persons Not Listed Below” for these person characteristics.

Table 7A

Characteristics	Applicable Subgroups
• Race and Ethnicity of Householder (White, non-Hispanic and Black, non-Hispanic)	Total Housing Units
• Borough Totals	Renter Occupied (Stabilized, Mitchell Lama, Public Housing) and Owner Occupied (Condominiums and Total Cooperatives)
• Sub-borough of Staten Island Totals	Total Housing Units, Total Occupied Housing Units, Total Rental Housing Units and Total Occupied Rental Housing Units
• Contract Rent < $300	Total Housing Units and Total Occupied Housing Units
• Wheel Chair Accessibility	All subgroups except Renter Occupied - Controlled and Owner Occupied - Conventional
• Floor Unit is on (except basement)	
• Access from Sidewalk to Elevator/Unit without using Stairs	
• Households Not Receiving Part of Monthly Rent from Government Programs	
• Condition of Building External Walls, Windows, Stairways, and Floors of Building	Total Occupied and Total Renter Occupied
• Number of Building Condition Problems 1-4	

Table 7B

Characteristics	Applicable Subgroups
• Sub-borough Totals (All Boroughs Except Staten Island)	Total Housing Units, Total Occupied Housing Units, Total Rental Housing Units and Total Occupied Rental Housing Units
• Structure Classification - Multiple dwelling units	Total Housing Units and Total Occupied Housing Units
• Structure Classification - One or 2 family house	Total Housing Units
• Rent Control Status	Total Rental Housing Units and Total Occupied Rental Housing Units
• Year Building Built	Total Occupied and Total Renter Occupied
• Number of Stories in Building	
• Number of Units in Building	
• Presence of Owner in Building	
• Elevator in Building with 2 or more stories	
• State/City Assisted Cooperatives	Total Owner Housing Units and Total Occupied Owner Housing Units
• Private Cooperatives	
• Private Condominiums	